

The Relationship between Multidimensional Psychological Well-being and Poverty

Abstract

Evidence from various academic fields indicates that mental health and income are correlated. Additionally, evidence exists that an increase in income improves psychological well-being and evidence that poor psychological well-being negatively impacts income. The difficulty is that there is no definitive work pinpointing the direction of the causal relationship between income and psychological well-being, but studies are attempting to find out. Hence, this paper attempts to contribute to ongoing work with an IV estimation approach to determine the causal effects of psychological well-being on poverty. Using data provided by Haushofer and Shapiro, this paper finds evidence that an increase in income causes a reduction in depression and stress levels, along with increases in happiness and life satisfaction of the study participants. Additionally, it is found that these improvements in psychological well-being lead to increases in monthly household expenditure, especially health care. Furthermore, these findings indicate that when women receive a cash transfer, a significant proportion of that transfer is devoted to health care. All the estimates presented in the paper indicate that an improvement in economic well-being leads to an improvement in the mental health of the poor, which causes them to spend more and focus more on their health care.

Keywords: Poverty; Consumption; Psychology; Well-being; Cash transfers, Development

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

1. Introduction

The World Health Organisation (2017) recently released a report estimating that 4.4% of the world suffers from depression, and this is higher in developing countries. Despite depression and other psychological disorders being ubiquitous and there being literature that looks at the association between psychological well-being and poverty (Amato & Zuo, 1992; Anand & Lea, 2011; Das, et al., 2007; Hanandita & Tampubolon, 2014), not much is known about the direction of the causation between psychological well-being and poverty. An individual's psychological well-being can influence their income, and it is also a possible income that has a significant impact on an individual's psychological well-being (Alloush, 2017). Hence, this paper attempts to fill this gap by extending the work of Haushofer and Shapiro to determine the causal effects of psychological well-being on poverty using an instrumental variable approach and a dataset provided by the authors.

A study by Haushofer and Shapiro (2016), analysed the short-term impact of unconditional cash transfers (UCT) on poor people, in Kenya. Haushofer and Shapiro found that cash transfers lead to improvements in the overall lives of the people, for instance, in their psychological well-being, and consumption patterns. Additionally, the authors found that the granting of UCT's improved the demand for health, but they do not investigate whether improved psychological well-being could be a relevant mechanism through which this occurs. The determination of how improved psychological well-being may be a mechanism that improves the demand for health is a question this paper seeks to address. Specifically, I seek to address two interrelated questions. For one, does an improved psychological well-being improve expenditure patterns? Secondly, does the improved psychological wellbeing cause an improvement in overall demand for health? The analysis of these questions contributes to the literature that has linked increased income in less developed countries (LDC's), to improved health and mental well-being (Rajan et al., 2013; Preston, 1975).

This study seeks to answer the questions stated above by using the data provided by Haushofer and Shapiro. The data, along with its Stata do-files, were made available publicly by the authors after it was published.¹ This study extends the analysis of Haushofer and Shapiro (2016), hereafter referred to as H-S, by investigating the role of psychological mechanisms in generating poverty impacts. The H-S study has a number of results that are caused by receiving a UCT. However, there are mechanisms they fail to examine, because H-S does not attempt to

¹ (<http://www.princeton.edu/haushofer/>)

examine the relationship between expenditure and psychological well-being. The authors provide results on aggregate consumption and psychological well-being but do not explore whether the two intersect or how they could intersect.

Previous literature in the field has illustrated that a positive relationship exists between increased income and aggregate expenditure. Additionally, a relationship exists between increased income and psychological well-being (Haushofer & Shapiro, 2016; De Hoop et al., 2013; Mani et al., 2013). However, the authors do not illustrate whether there exists a relationship between improved psychological well-being and aggregate consumption. Hence, this study aims to find whether psychological well-being is instrumental in the consumption choices that are made by the study participants, intending to determine if this impacts their overall health positively or negatively. These findings allow for the paper to extend on the paper by H-S, using the available data.

Furthermore, previous research indicates that increased income results in increased consumption, along with improving psychological well-being (Diener et al., 1999; Fiszbein & Schudy, 2009; Parekh et al., 2010). However, what is unknown is whether improved psychological well-being improves the consumption patterns of the beneficiaries, nor how this will impact their health activities and expenditure. This paper aims to test the hypothesis that the psychological well-being of the study participants affects their consumption patterns, with the alternative hypothesis being that there is no effect because consumption is an effective measure of poverty (Zinkhan, 1992).

Using the data provided by H-S, this paper begins by examining the findings of H-S on the effects of the UCT's on consumption by testing the robustness of their econometric results. However, H-S did not specify their demand functions as Engel Curves, which occurs when the dependent variable is represented in budget-share terms (Deaton & Muellbauer, 1980). To check the robustness of their results, I begin my analysis by re-estimating their models in table 1 by making the dependent variables budget shares². The results estimated are similar, in part, to H-S, finding that household spending is unitary, because there is no large difference in spending when the recipient of the transfer is male or female. The results estimated are similar, in part, to H-S, finding that household spending is unitary because there is no substantial difference in spending when the recipient of the transfer is male or female. There is a large, statistically significant decrease in non-durable expenditure, 5% when compared to the control

² Pg. 2016 in Haushofer and Shapiro (2016)

group. The estimates indicate statistically significant decreases in the spending of food, cereal, tobacco, and social events. However, the estimates differ in the different treatment arms and are depicted in detail in table 1.

I then turn to the question on the impact of cash transfers on psychological well-being. This merely replicates the findings in H-S. However, in my approach, these are the first stage estimates that are used to instrument the effect of psychological well-being on consumption. From this, I find the first stage treatment effects on psychological well-being, along with the different types of transfers. The findings indicate an improvement in the overall psychological well-being in the treatment group, with the psychological well-being index being positive and statistically significant at the 1% level (Haushofer & Shapiro, 2016). Table 2 reveals the results in more detail, detailing the significant decreases in depression, stress and self-reported worries, and increases in happiness scores, life satisfaction, and optimism. These statistically significant findings are in line with the findings estimated in the instrumental variable estimation.

In the final part of my analysis, I use the first-stage estimates to instrument for psychological well-being in estimating its impact on consumption, especially health expenditure. Before the IV estimation could take place, the data had to be aligned to reflect consumption by villagers who have psychological well-being data. This amendment allows for the data to provide reasonably informative estimates of psychological well-being and its impact on consumption. The estimates provide results that indicate a reduction in CESD scores (depression) has a significant impact on household spending. A reduction in the CESD score has a positive statistically significant effect on the spending of food, protein, social expenditure, and non-durable expenditure. An increase in happiness allows households to spend more, especially on food, protein, and medical expenditure, as they are statistically significant at the 5% level. When transfers lead to an improvement in life satisfaction, results indicate that there are statistically significant increases in the spending on food, protein, social, and medical expenditure. The increase in transfers causes a reduction in self-reported worries and stress. These changes cause statistically significant increases in spending on food, protein, social, and medical expenditure for the treatment groups. Furthermore, these findings are similar to the statistically significant findings in H-S and are per the first stage estimates in table 2.

The thesis is structured as follows: Section 2 presents a discussion of the relevant literature on poverty, expenditure, and psychological well-being. I discuss the choice of consumption as a

measure of poverty, how consumption and psychological well-being interact, and how health expenditure is perceived in poor communities. Section 3 presents a discussion of the data, model specifications, and empirical methodologies followed by H-S and the methodological similarities and dissimilarities between my work and that of H-S. Section 4 presents the empirical findings, while the final section (Section 5) provides concluding remarks, along with a discussion of the limitations involved in conducting the study and possible areas of further research.

2. Literature Review

This section intends to highlight theories that are encompassed in studies on poverty, psychological well-being, consumption patterns, and how the poor perceive health. The definition of psychological well-being differs from paper to paper in various academic fields. Since there are differences in the definition of psychological well-being, researchers have implemented ways to define psychological well-being to best suit their research goals. A popular method is to create an index that incorporates several psychological indicators, similar to the index used by H-S (O'hare, 2014).

Poverty is a topic that has been defined and studied all through history. This allows for the dissection of theoretical literature on the psychology of poverty, to showcase how the two intersect. Furthermore, theories on consumption and how it interconnects with psychological well-being will be reviewed, touching on-demand and Engel curves. Hence, this section reviews the theoretical and empirical literature on poverty, psychological well-being, and cash transfers.

2.1 Theoretical literature

Previous literature has provided substantial theoretical and empirical evidence that poverty, mental health, along with psychological well-being are all negatively associated with one another (Hanandita & Tampubolon, 2014; Aizer et al., 2016; Ferrer-i-Carbonell, 2004). Research has indicated that low levels of income, education attainment, and social class, all lead to poor psychological well-being, which is also a symptom of poverty (Lund, et al., 2010; Hanandita & Tampubolon, 2014). Literature has indicated that poverty leads to poorer health, higher risk of infant mortality, low housing quality, and increased substance abuse, among other things (O'Hare's 2014; Parekh, et al., 2010). These empirical findings on what poverty causes leads to the need for understanding exactly how being trapped in poverty affects an individual's psychological well-being.

Well-being is defined differently across an array of studies and academic fields. In a study by Kahneman, Diener, and Schwartz (2003), well-being was defined as a situation that involves a factor of judgement and comparing your ideas, aspirations, and position against others. The authors state that it ultimately represents a person's perception of their position to those of the stated subjective views; this can also be considered a subjective definition of well-being. A similar definition to that of Kahneman, et al (2003), is that "*subjective wellbeing is a scientific term used in psychology for an individual's' evaluation of his or her experienced positive and*

negative affect, happiness and satisfaction with life" (Frey & Stutzer, 2002:403). In the study by H-S (2016), psychological well-being is indexed by many variables, causing the authors not to provide a distinct definition of psychological well-being. This occurrence is not uncommon as the definition of psychological well-being differs across academia and is not well captured by any single affective, psychological, and behavioural or brain state (Carlisle & Hanlon, 2007).

Furthermore, the literature on psychological well-being has provided determinants to it, to provide an understanding of what could affect the well-being of an individual. Hence, from a number of survey articles by Argyle (2003), Diener, Suh, Lucas and Smith (1999), MacKerron (2012), and O'Hare (2014), the following are considered determinants and influences of an individual's psychological well-being: Income; Age; Health; Employment; Relationships. These all affect the psychological well-being of an individual, but income and health are the most frequently analysed (Haushofer, 2013; O'Hare, 2014; Hanandita & Tampubolon, 2014; Haushofer & Shapiro, 2016).

A further possible influence on an individual's psychological well-being is the consumption of goods and services, as it goes hand-in-hand with the influence income has on an individual (The Royal Swedish Academy of Sciences, 2015; Deaton, 1996). It is imperative to understand consumer behaviour theory when attempting to understand how psychological well-being impacts consumer behaviour. Consumer decision making has been of interest to researchers for many years (Bray, 2008). Two prevalent theories on consumer behaviour are the *expected utility theory* and the *forward-looking theory of consumption* (Bray, 2008; Mostert, 2002). According to Mongin (1997), Expected Utility Theory (EUT) proposes that consumers decide between "*risky or uncertain prospects by comparing their expected utility values, e.g., the weighted sums obtained by adding the utility values of outcomes multiplied by their respective probabilities*". For instance, this is a theory that proposes the consumer considers the probability of the possibly outcomes from a situation, like an UCT, and compares these outcomes to the expected utility they will receive before making decision. The EUT is a theory that determines how a consumer will choose rationally, when they are uncertain of the outcome, but states that consumers choose the outcome with the highest expected utility (Bray, 2008; Zinkhan, 199; Briggs, 2018).

Furthermore, the forward-looking theory of consumption is a combination of two theories, the life-cycle model by Modigliani and Brumberg and the permanent-income model theorised by

Friedman (Mostert, 2002). Mostert (2002) derives the life-cycle theory as a situation when households plan its lifetime consumption pattern, with the aim of maximising the total utility it receives from consumption during its lifetime. The permanent-income model is similar to the life-cycle theory, but differs in that it has a two period “infinitely long horizon” instead of the life span (Mostert, 2002). These theories assume that the consumers are rational in their decision making and decide according to their preferences.

Bagozzi (2000) critiques the language used to define utility, stating that is ‘narrowly defined’ (2000:96) and that the utility theory assumes mental content in its very definition, which is not ideal. Additionally, Briggs (2016) objects to the EUT as the author states that maximising EUT is impossible. The author critiques the theory by arguing that consumers will need a complex understanding of the available options, the possible outcomes, and the expected value of these outcomes, and that choosing the option that is utility maximising is more difficult than choosing the option is solely good enough for the consumer. Furthermore, authors critique EUT by explaining how, according to EUT, preferences need to be transitive and complete, or else the consumer will be indifferent between options. However, these axioms are not entirely secure, because there are instances that allow failures in transitivity and failures of completeness (Briggs, 2018). This critique is supported Tversky (1975) in which he describes how EUT is based on a particular consumer view of the outcomes, and this may allow for the interpretation of the expected utility to be valid for one consumer, and invalid for the other. Hence, since people’s preferences are different, not matter how much money is provided to them, expected utility theory is considered to not provide enough description in relation to a consumers decision making, when facing uncertainty.

Although there are critiques on how these theories are defined, it has to be stated that these theories focus on the economic man's interpretation of defining consumer behaviour. There are different approaches to analysing consumer behaviour and decision making. Besides the economic man or ‘Homo economics’ approach, consumer behaviour is studied through psychodynamic, behaviourist, cognitive, and humanistic approaches (Bray, 2008). The psychodynamic approach dictates that behaviour is a victim of biological influences through intrinsic drivers, which occurs outside of one's conscious thought (Bray, 2008; Arnold, 1991). The behaviourist approach dictates that external events can learn behaviour; this discredited the psychodynamic approach at the time (Bray, 2008; Watson, 1920). Unlike the behaviourist approach, the cognitive approach links observed behaviour to interpersonal cognition (Stewart, 1994). Furthermore, the humanistic approach aims to explore concepts that are introspective to

the consumer at the individual level instead of describing generic processes. This has caused the humanistic approach to be identified as a way to improve on the cognitive approach (Bray, 2008).

The literature on poverty and its psychological outcomes has been limited, because many believe that poverty is all about material scarcity, but having almost nothing will have psychological consequences (Haushofer, 2013). For instance, not having an income to get an education, go to the hospital, to eat, to live a decent life, will have an impact on the psychological well-being of a person. It is also true that wealthy people have mental health issues. For instance, it has been shown that wealthy people can also display significant morbidity rates on many screens of psychological well-being. This fact then begs the question as to which direction the causation runs to. While the focus in H-S is suggestive of the causal connection running from income to depression, reverse causation is also plausible and provides the rationale for the hypothesis set out in this paper.

2.2 Empirical Literature

Empirical studies about the impact of income on the psychological well-being of individuals are conducted all over the world. These empirical studies intend to determine whether income and psychological well-being are correlated, and in which direction the causation runs. Evidence from varying disciplines suggests that income affects psychological well-being, while other studies suggest that poor psychological well-being can have significant adverse effects on income (Alloush, 2017). Since it is not clear in which direction the causation runs, this uncertainty allows for a plausible hypothesis to be framed around the impact of economic well-being on psychological well-being or vice versa. However, there is an abundance of literature that provides empirical evidence which supports the hypothesis that the causal connection runs from income to psychological well-being.

The innovative work by H-S is one that provides evidence to support the hypothesis that the causal connection runs from income to psychological well-being. Their study was implemented in villages where Randomized Control Trials (RCT's) were piloted. For H-S, the aim was to determine the effects that UCT's will have on psychological well-being, and they found that the increased income did have a significant increase in the psychological well-being of the study participants. Their findings indicate that a reduction in poverty, through increases in income, reduces stress levels and depression, while increasing happiness and life satisfaction (Haushofer & Shapiro, 2016).

Similarly, in a study by Baid, De Hoop, and Özler (2013), which aimed to identify the causal effects of UCT's on the mental health of schoolgirls, in Malawi, the authors found that the cash transfers reduced the psychological distress on the schoolgirls when their households received the income. Another study on the impact of UCTs indicated that the relationship between exogenous reductions in a neighbourhood's poverty rates had positive effects on mental health, which was attributed to a reduction in stress levels due to increases in income levels and economic self-sufficiency (Liebman, Kling, Lawrence, 2006). A similar study was conducted on the long-run impact of cash transfers to low-income families, but instead of focusing on neighbourhoods, it focused on poor military families and whether children from military families end up attaining education, and a self-sufficient life (Aizer, et al., 2016).

Besides UCT's, there are studies that have been conducted with conditional cash transfers (CCT). For instance, the Baid, De Hoop, and Özler (2013) study was unique because it allowed the researchers to test both the impact of UCT's and CCT's on the mental health of school girls. The difference between UCT's and CCT's was that the CCT's provided income to families on the condition that school-age girls, in the household, had to attend school regularly. CCT's are considered to have varying significant results, with there being visible evidence that CCT's have improved the use of education, health services, and mental well-being. However, evidence on the impact of CCT's "final" outcomes are not as clear, because people might be enrolling into school more when the programs are initiated but do not improve their results (Fiszbein & Schudy, 2009).

The very problem of being in poverty could be the reason as to why the poor perceive health in the way they do. A study by Loignon et al., (2015), which explored the barriers to responsive care for the poor, intending to develop equality-focused primary care. It found that people living in poverty have weak interactions with healthcare providers, and have poor psychological well-being, which are all barriers to providing equity-focused primary care. It is clear that conceptually, several reasons lead to a higher occurrence of deprived mental health in the poor. The possibility of poverty causing poor psychological well-being may indicate that the causal relationship runs in the opposite direction because poor mental health can further impoverish people through high health costs and unemployment (Das et al., 2007).

A severe limitation found in the literature on these topics, like psychological well-being, is that they are incomplete because, there is no detailed view of how psychological well-being impacts consumption and whether it improves the lives of the poor. A second limitation is that there is

theory that suggests consumption measures the well-being of a household more appropriately than current income, which is flawed due to current income being susceptible to many fluctuations that cause unemployment and no income (Meyer & Sullivan, 2003). However, there is empirical evidence that illustrates how improvement in income improves the psychological well-being of those who receive the income, but also indicates how increased income does not always improve well-being.

Hence, the empirical evidence on a linkage between psychological well-being, poverty, consumption, and income being mixed. Using survey data, Das et al., (2008), were unable to find a relationship between poverty and mental health, while Haushofer and Shapiro (2016); Liebman et al., (2006); Aizer et al., (2016); Hanandita & Tampubolon, (2014), all confirmed casual relationships between poverty, increased income and mental health, and the evidence of the effects that UCT's and CCT's have on mental well-being portrays a more consistent picture (De Hoop et al., 2013). The evidence provided by these studies provides the rationale for my investigation because the researchers determine that the causal direction runs from income to improved psychological well-being, which allows me to determine in which direction the causal relationship runs between consumption and psychological well-being. From the evidence, it is clear that improved psychological well-being stems from increased income along with the increase in income, causing an increase in consumption by the study participants. Therefore, this evidence and the work pinned down by H-S allows me to investigate the unanswered question on how improved psychological well-being impacts the participant's demand for health.

3. Data & methodology

This study utilises data provided by H-S, who studied the UCT programme that was implemented by NGO GiveDirectly. GiveDirectly provided UCT's of at least twice the average monthly household consumption, or at least USD 404 PPP, between 2011 and 2013. The recipients of these transfers were poor households in Western Kenya, and the money was distributed using M-pesa, a cell-phone based mobile money service (Haushofer and Shapiro, 2016)³. The use of GiveDirectly program allowed for large transfers over a short period of time, and given to recipients who met the test criteria which allowed H-S to assess the response of a broad sample of households to large unanticipated changes in wealth. The responses to these changes in wealth were measured using a RCT with a two-stage randomisation, at village and household-level (Haushofer and Shapiro, 2016).

The two-stage randomisation carried out by H-S resulted in treatment and control villages, which in turn resulted in "treatment" and "spillover" households in treatment villages, and "pure control" households in control villages (Haushofer and Shapiro, 2016:2). H-S utilised the UCT programme by GiveDirectly. People living in a house with a metal roof, as determined through a census, were considered eligible for the programme. The census was conducted through March into November 2011 in treatment villages, and in April-June 2012 in control villages. Once the census was assessed, all eligible households completed the baseline survey between April and November 2011 (Haushofer and Shapiro, 2016:8). Furthermore, Haushofer and Shapiro (2016) state that the endline survey was conducted between August and December of 2012, and the order in which villages were surveyed followed the same order as the baseline survey.

Therefore, using the data, in the remainder of this section, I outline the variables used by H-S to construct the psychological well-being index (a standardised weighted average of the clean cortisol levels, worries, stress, CESD, happiness, and life satisfaction variables), along with the aggregate consumption. Secondly, I discuss how those variables are used to replicate table V from H-S. In the third sub-section, I outline the model specifications for the ordinary least squares (OLS) regressions that will be conducted. The fourth sub-section describes the instrumental variables approach used in my analysis.

³ According to H-S all USD values are calculated at purchasing power parity, using the World Bank PPP conversion factor for private consumption for KES/USD in 2012, 62.44. The price level ratio of PPP conversion factor (GDP) to KES market exchange rate for 2012 was 0.5.

3.1 Measurement of Depression and Stress

Since this paper uses the data provided by H-S, it uses the definitions provided by the authors to describe the psychological index, which includes the standardised weighted average of the study participant's CED scores. The use of the CESD scale is a standard approach in measuring depression symptomatology in the general population (Radloff, 1977). It conceptualises depression not as a dichotomous state, but rather as a continuum state (Wood et al., 2010; Radloff, 1977). The scale consists of 16 negatively worded items (e.g., "I felt I could not shake the blues even with the help from my family and friends", "I felt sad"; "I thought my life had been a failure") and 4 positively worded items, which is why the variable is negatively coded (Wood et al., 2010). The index also includes the perceived stress scale (PSS), which is a psychological instrument used for measuring the perception of stress (Cohen et al., 1983). It is used to measure which situations are considered as stressful in an individual's life. The index also includes participant responses to the World Value Survey happiness and life satisfaction questions, and their log cortisol levels (Haushofer and Shapiro, 2016).

Additionally, each household was surveyed by two distinct modules: a household module, which included information on consumption, assets, food security and health; and an individual module, which collected information on psychological well-being, intra-household bargaining, and so forth. (Haushofer and Shapiro, 2016). Similar to the psychological well-being index, consumption encompasses a number of variables. Aggregate consumption includes the monthly totals (in 2012 USD), by all household members, on food, cereals, meat & fish, alcohol, tobacco, social expenditure, medical expenditure and education expenditure. Therefore, with indices defined, it allows for better analysis of the results.

3.2 Budget Share approach

When researchers have studied consumption, it has been found that individual decisions are often decomposed in many ways (Deaton, 1996). The ideal approach would be to distinguish consumption decisions across goods in a given period. This is the general approach where several commodities at a given time and total spending are chosen simultaneously, at that time, intending to maximise the expected utility (Deaton & Muellbauer, 1980). Ideally, the approaches can be presented in a demand system of equations, with quantity demanded on the y axis, with prices and total expenditure on the x-axis and a perfect example of such is the Engel curve. An Engel curve describes how a consumer's decision making, for instance, the buying of food, varies as the consumer's total income or expenditure varies (Lewbel, 2006).

An Engel curve for a household connects the budget share:

$$BS_{jh} = \frac{consumption_{jh}}{total\ expenditure_h} \times 100 \quad (1)$$

Equation (1) illustrates how the budget share of the average household was calculated. Non-durable expenditure is the total household expenditure and $consumption_{jh}$, indicating the total consumption of a commodity, j , for the household, h . This will allow me to replicate the aggregate consumption findings of H-S, but extending on their findings by representing the shares in which households distribute their consumption when they receive a cash transfer. This is the first instance in which the paper intends to depict the demand for study participants. It is critical to determine if the findings in this paper differ significantly from the findings in H-S.

3.3 Model Specification

The use of transforming the data to budget shares allows me to represent in which category the larger share of the household income was spent. The budget share approach is used to provide a different way of viewing the work on expenditure treatment effects by H-S. The USD PPP approach implemented by H-S is not the standard approach, while the use of budget shares is a more traditional approach (Deaton, 1996). Hence, to estimate the treatment effects on consumption the following OLS equation is used:

$$BS_{jh} = \alpha_v + \beta_0 + \beta_1 Treat_{vh} + \sum \alpha_k + \mu_i \quad (2)$$

BS_{jh} is the budget share outcome of the household. β_1 is the estimate of the treatment, while $Treat_{vh}$ is a treatment indicator, which takes the value of 1 for the household that receives transfer and 0 if not. Additionally, it is also used when attempting to represent the different treatment arms. $\sum \alpha_k$ represents the baseline covariates gathered from the baseline survey which include household size, age, marital status, number of children, and value of non-land assets, and years of education within the household. OLS regressions include village fixed effects, α_k and controls for baseline outcomes.

$$Y_{jh} = \alpha_v + \delta_0 + \delta_1 treat_{vh} + \sum \alpha_k + \mu_i \quad (3)$$

Equation 3 is similar to equation 2. Equation 3 is the OLS regression estimate of the treatment effects on psychological well-being. This will replicate Table IV from H-S. Y_{jh} is the disaggregated psychological well-being variable, with aim of estimating how the cash transfers impact the psychological well-being of the recipient, δ_1 is the estimate of the treatment of the

cash transfer on psychological well-being, while $treat_{vh}$ is the treatment indicator. Again, the regression includes village fixed effects, α_k and controls for baseline outcomes.

The study aims to determine that the cash transfers, with the improvement in psychological well-being, will improve the expenditure of the average household. However, it is clear that this form of OLS estimation will not be enough to substantiate the claims, and achieve the objectives set out. Hence, I intend to implement instrumental variable estimations as it is more robust and removes the possible endogeneity in the psychological well-being index.

3.4 Instrumental Variable estimation

Instrumental variable methods are used throughout economics to deal with problems of endogeneity and measurement (Baum, 2007; Buse, 2003). The OLS regression contains errors in measurement, although the error is independent of the true value of the psychological index the error will cause the regression to produce inconsistent and biased parameter estimates (Baum, 2007). Hence, here, treatment status will be used as an IV for the psychological index; this is to determine the effect of the psychological index on disaggregated consumption. Treatment status is used as an IV as it meets the conditions to be a valid instrument, as it is uncorrelated to the error term (μ_1) due to treatment status being randomly assigned, and is correlated with the regressors (Baum, 2007). To confirm that treatment status is correlated with the regressors, I will show evidence (in Section 4) through my analysis that δ_1 is statistically significant for many psychological well-being measures.

To investigate the causal effects of psychological well-being on consumption, I follow two approaches. First, I estimate a two-stage least squares (2SLS) regression of the effect of the psychological *index* on *disaggregated* consumption:

$$PsyIndex_i = \alpha_v + \delta_i Treat + \mu_i \quad (4a)$$

$$Y_{jh} = \alpha_v + \delta_0 + \delta_1 psyindex_i IV + \sum_{i=k}^n \delta_k + \mu_i \quad (4b)$$

Where the psychological index is instrumented by treatment assignment and $\sum_{i=k}^n \delta_k$ the indicator for the categorical covariates, like age and gender. These equations are used to estimate the effect of the psychological index variable on the disaggregated household consumption variables, like food, tobacco, alcohol and medical expenditure.

In the second approach, I estimate how the various variables that encompass the psychological well-being index (cortisol, depression, worries, stress, happiness, life satisfaction, trust, optimism and self-esteem) impacts consumption:

$$wellbeing_i = \alpha_v + \delta_i Treat + \mu_i \quad (5a)$$

$$Y_{jh} = \alpha_v + \gamma_0 + \gamma_1 wellbeing_i IV + \sum_{i=k}^n \gamma_k + \mu_i \quad (5b)$$

Again using treatment assignment as an instrument for each measure of psychological well-being and where $\sum_{i=k}^n \gamma_k + \mu_i$ again represents other control variables. The utilisation of the IV regressions in this study are based on the assumption that the cash transfer only affects consumption indirectly (through its effect on psychological well-being) and not directly. Hence, it is a statistical assumption that there is endogeneity within the psychological well-being index. This assumption is supported by H-S as the authors state that there is endogenous selection in the pure control condition, as some of the households may have upgraded to a metal roof during the time of the study (this is the criteria for eligibility), and this criterion was applied in the end line of the survey, not the baseline (Haushofer & Shapiro, 2016). This raises the issue that the village treatment effect estimates are biased, which makes the use of 2SLS ever relevant.

4. Empirical analysis

Here the paper presents the results that were found using the equations and the estimation techniques described earlier. The first section of this analysis showcases the results to the first two equations, aiming to answer the question on how consumer behaviour reacts to the different transfers they receive, who receives it, and how it differs from the control group. This is an extension on H-S table V, as it differs in approach, and assesses the robustness of their results. The second section analyses the results from the IV estimation that was implemented to determine the effect of the psychological index on disaggregated consumption, when treatment status is the IV for the psychological index. Before the IV estimation can take place, I discuss the results of the first stage estimation of the treatment effects of the cash transfers on psychological well-being. This will depict every variable that encompasses the psychological well-being index and the effects the cash transfers have on them. Once the first stage estimation is complete, I estimate how psychological well-being impacts consumer behaviour, by estimating it on disaggregated consumption.

4.1 The impact of Cash Transfers on Consumption

Here I detail the estimates for budget shares of the expenditure variables. The expenditure shares were calculated using equation 1. This differs from H-S, due to the authors defining their dependent variable in USD PPP terms, while I have opted to use budget shares (in percentages). I have opted to follow the standard practice of defining the dependant variables as budget shares as opposed to the approach used by H-S (Deaton & Muellbauer, 1980; The Royal Swedish Academy of Sciences, 2015). Hence, with this difference in approach, it is key to analyse if any differences appear between estimates in this study and table V in H-S. The dependent variables are flow expenses with food, alcohol, tobacco, medical expenditure, education expenditure, and social expenditure summing to be non-durable expenditure. These results are presented in Table 1.

Overall, the results indicate a significant decrease in the monthly flow of non-durable expenditure of 5.3%; this demonstrates that before non-durable expenses constituted 96% of total consumption, but there is a significant decrease. H-S (2016), find that there is an increase in the consumption of non-durables, which could still be the occurrence. However, these results indicate that a lesser share of the cash transfer is spent on non-durables for the treatment group. The impact of the cash transfers on food expenditure is negative and statistically significant; relative to the control group, the treatment group decreases food consumption by 5.4%. Additionally, expenditure on protein has increased, the treatment group has increased

consumption in meat & fish by 1%. The expenditure on cereal is negative and statistically significant; the treatment group decreased their consumption of cereal by 2%. Unlike in H-S, where there is a statistically significant proportion of spending on medical expenditure, this is not present in my estimates. Table 1 indicates that lesser shares of the cash transfer are spent on certain expenditures. Yet, H-S depicted that there will be increases in consumption, which is accurate, but not the entire picture. There are more differences between H-S in the estimates of the different treatment arms.

In table 1, columns 3 to 5 represent the different effects that different treatment types have on household budget shares. Firstly, there are very few differences between female and male recipient households. These findings depict that household expenditure is unitary due to expenditure shares not differing when the transfer is recipient is male or female. This finding stands in stark contrast to the literature on the subject, but similar results were found in H-S. Additionally, researchers have stated that the unitary model is convenient because standard consumer analysis tools can be applied, but this stands on weak grounds (Browning & Chiappori, 1998). These weak grounds are challenged by neoclassical utility theory, which applies to people and not their households; and the empirical evidence that the unitary model does not hold (Thomas, 1990; Browning & Chiappori, 1998; Haushofer and Shapiro, 2016; Chiappori & Donni, 2009). Column 4 depicts the differences between monthly and lump-sum transfer recipient households, and the only significant variables are food expenditure and non-durable expenditure.

This finding depicts that households who receive the monthly transfer increased their share of expenditure towards food and overall monthly expenditure, while lump-sum recipients did not. This differs from the result by H-S, because the authors found that expenditure in households receiving monthly transfers did not differ from lump-sum recipient households. None of the author's coefficients were statistically significant, while I found positive statistically significant coefficients with increases in food and non-durable expenditure shares. Finally, households who received large transfers spent significantly of their consumption on food (7%), cereals (1.9%), and overall monthly expenditure (6.5%) than those who received small transfers. However, there is a significant decrease in the share of consumption that goes towards temptations goods, which suggests that smaller transfer recipients distributed their expenditure in the more appropriate areas, like food, protein, medical, and educational expenditure. Again, this differs from H-S because they found that none of their categories indicated differential

effects for large transfers. Although there are similarities in my and H-S findings, there are a few apparent differences.

These findings depict how the recipient households distributed their total expenditure to non-durables. It is clear that the cash transfers increased overall expenditure. However, there are differences between the findings in this paper and the findings by H-S, and that is down to the differences in methodological approach. Using budget shares allows for a clearer analysis of how households spend their income, as it is the standard approach in analysing demand functions (Deaton, 1996). While there are differences in estimates, as stated, there are similarities and statistically significant findings that coincide with H-S. The similarities in the findings by H-S and myself are especially evident when comparing the treatment effects. Hence, it is important to determine the kind of impact an improved psychological well-being has on household consumption.

4.2 The Impact of Cash Transfers on Multi-Dimensional Psychological Well-Being

Table 2 replicates the first stage results of the IV estimates reported in Table IV of H-S.⁴ A statistically significant treatment effect of 0.26 standard deviations (SD) is found on the psychological well-being index (as defined in Section 3). This indicates that an increase in cash transfers leads to a significant improvement in psychological well-being. A significant portion of the increase stems from the 1.16 point reduction in CESD scores, a 0.26 SD, and 0.13 SD reduction in stress and worries, respectively. The cash transfers lead to significant increases in happiness scores, 0.16 SD, and life satisfaction, 0.17 SD. These findings demonstrate that a reduction in poverty causes significant increases in happiness, life satisfaction, and improves optimism while causing significant decreases in stress and depression (Haushofer and Shapiro, 2016). While treatment effects indicate significant increases in psychological well-being, it is important to note how the effects differ between the different treatment arms.

Overall, there is a significant improvement in psychological well-being by 0.14 SD in a female-headed household compared to a male-headed household. This difference is driven primarily by reductions in cortisol and higher self-esteem. This can be caused by men feeling less stress when the female is in charge, with there being no expectation on him to "provide" for the household (Haushofer and Shapiro, 2016; Knorr et al. 2010). There is no significant improvement in the psychological well-being index in households that received monthly transfers compared to households who received lump-sum transfers. As column 4 in table 2

⁴ Table 2 is a replication of table IV found on page 2011 in Haushofer and Shapiro (2016)

shows that the coefficients for log cortisol levels are significant at the 10% level, entailing that the cortisol levels of households receiving monthly transfer's increases, whereas depression decreases significantly, suggesting that the overall effect on the psychological well-being index is nullified. H-S (2016) finds this surprising due to their expectation of cortisol levels being lower in monthly recipients, but this may have arisen because monthly transfer recipients may have found it difficult to save (they were expecting money every month). Hence, from this failure to save, there were increases in cortisol levels due to stress.

Furthermore, when comparing large and small transfer recipients, there is a significant increase in the psychological well-being of recipients of large transfers. Psychological well-being is 0.26 SD higher for recipients of large transfers, and this stems from a 1.22 point difference in depression scores, along with a 0.18 SD difference in life satisfaction and 0.24 SD difference in stress between large and small transfer recipients. Hence, it is clear that poverty alleviation will improve psychological well-being (Haushofer and Shapiro, 2016; Rajan et al., 2013; Easterlin, 2001). However, it is not clear how this improved psychological well-being impacts the consumption behaviour of recipient households. Therefore, the following section provides the analysis of the IV estimation results to estimate the impact of improved psychological well-being on consumption, with a focus on the impact on the demand for health care.

4.3 Instrumental Variable Analysis

Earlier, it was described how, and why, treatment status would be an IV for the psychological index and the variables that the index consists of. The aim of this approach was to remove the endogeneity that is present in the psychological well-being index, along with depicting the impact that psychological well-being has on household consumer behaviour. This will be determined by looking at the impact that each psychological well-being variable has on expenditure when it is instrumented by treatment status. The first stage findings are represented in table 2 and the results indicate that psychological well-being improves when a cash transfer is received, as it is statistically significant at a 1% level. Hence, knowing that psychological well-being is endogenous, yet statistically significant, is key to the validation for instrumenting treatment status on the psychological well-being index. It also supports the hypothesis set out earlier that an improved psychological well-being can positively impact demand for health and consumption patterns.

4.3.1 The Impact of Multidimensional Well-Being on Consumption

Using treatment status as an IV for the psychological well-being index has yielded the results presented in table 3, using equation 4 described earlier. Overall, the results indicate that there is a statistically significant increase in non-durable expenditure caused by an improvement in the psychological well-being index. The results indicate that when a person receives a cash transfer, and their psychological well-being increases, their monthly household expenditure would be USD 165 PPP, which is greater than the control mean. There are significant increases in food, social, protein, and medical expenditure. These increases indicate that when the psychological index increases, and the person receives a transfer, their monthly household expenditure will improve as hypothesised. From the treatment effects, there is a significant increase in the spending on medical expenditure when psychological well-being improves. These findings specify that the estimated expenditure will significantly improve when there's an improvement in the psychological well-being, especially on health expenditure.

Moreover, throughout the different treatment types, food, protein, social, and monthly expenditure remain significant, although they decrease in their estimated values. When the recipient of the transfer is female, estimated expenditure on food, cereal, protein and social expenditure all increase significantly compared to the male. This finding indicates that households might not be unitary in their consumption as identified by H-S. For the household to be unitary in their consumption, there would have to be no differences in their consumption behaviour (Browning & Chiappori, 1998; Chiappori & Donni, 2009). However, this is not happening in this instance. This significant difference in consumption between the recipients is due to the improved psychological well-being impacting the female more significantly than the male. Table 2 indicates that female cash transfer recipients have lower cortisol levels, high self-esteem and their psychological well-being index values are higher compared to the male. These differences between male and female-headed households are reasons as to why females spend more

There is an indication that households that receive monthly transfers spend significantly more on food, cereals, protein, and social events when there is an improvement in the psychological well-being of the recipient. These estimation results differs from the H-S findings for the treatment status, because they found no significant differences between monthly and lump-sum transfers. However, in this study, it is clear that when the psychological well-being of the recipient improves the recipient household will spend more with their monthly cash transfer, than when they receive a lump-sum. When the comparison between large and small transfers

are estimated, the results indicate that recipients of large transfers spend significantly more than recipients of small transfers. Expenditure on food, cereals, protein, and social events increase significantly. Although there is no significant increase in medical expenditure in the treatment arms.

When analysing the treatment arms the only statistically significant increase in medical expenditure stems from the female recipient household, as seen in column 3 in table 3. This finding is significant, because it indicates that female-headed households spend more on health when their psychological well-being improves, and there is an influx of cash. From the results depicted in table 2 it is clear that average cortisol levels in female recipients households decreases due to the increase in income, and this causes these female headed household to increase their demand for health care. Additionally, this finding is significant due to household income being a significant predictor for high household medical expenditure (Molla, Chi & Mondaca, 2017). Hence, these estimated results indicate that an improvement in psychological well-being has a significant impact on the spending of transfer recipients. Therefore, these results make it key to determine how consumer behaviour reacts to improvements in specific well-being variables. This will allow for the determination of where the increase in medical expenditure stems from in table 3.

4.3.2 The Impact of Depression, Stress and subjective Well-Being on Consumption

Table 3 depicts a statistically significant increase in medical expenditure for the treatment group, compared to the control group, at the 5% level. There is also a significant increase in medical expenditure for the female recipient compared to the male recipient household. These findings provide evidence that an improvement in psychological well-being improves household health expenditure. It is imperative to determine exactly what mechanisms of psychological states are at work in driving this significant increase in expenditure, especially health expenditure. Hence, using equation 5 described above, I estimate a 2 stage least squares by instrumenting each psychological well-being variable with treatment status. From these estimations, I find results that indicate a number of psychological factors impact the expenditure of the household, especially health expenditure.

From H-S (2016), it is clear that the receiving of the cash transfer reduces depression scores for the recipient. In table 3, I show that an improvement in psychological well-being improves expenditure significantly. Hence, by using treatment status as an instrument on depression, table 4 shows that when there is a reduction in depression, there are significant increases in the

consumption of food, protein, and social expenditure. These changes in consumption are statistically significant across the treatment arms (gender of the recipient, frequency of transfer, and size of the transfer). The findings presented in table 4 allows for further support the finding that female-headed households spend more on health expenditure.

Hence, for the treatment group, there is an increase in monthly expenditure, in which 18.35% of the budget is devoted to food, 5.1% devoted to protein, and 2.1% to social events. These estimates are sensible in that when one is less depressed you tend to be more socially active than before (Anand & Lea, 2011). Additionally, these estimates do not alter significantly between the different treatment arms. From table 4, it is depicted that households are not unitary in their consumption when the recipient is less depressed and female. The results show that female recipients are more likely to increase their spending on food, protein, social events, and medical expenditure than male recipients. The increase in medical expenditure is significant because, in table 3, it is known that an improvement in psychological well-being causes an increase in medical expenditure for female recipient households. There are also significant increases in monthly expenditure when the recipient receives large and monthly transfers when compared to small and lump-sum transfers. However, there is no significant increase or decrease in medical expenditure in these treatment arms. This aligns with earlier findings that female recipient households spend significantly on health care when their mental health is in a better place.

Furthermore, the findings on how depression impacts consumption are apparent and expected, and it provides further evidence of the impact that psychological well-being has on consumption. This is further stimulated by the findings represented in tables 5, 6, and 10. The IV estimation on happiness, as presented in table 5, provides significant findings on the impact that an increase in happiness scores has on household consumption. Overall, an improvement in happiness, when a cash transfer is received, causes there to be a significant increase in monthly expenditure, as in column 2 of Table 5. The increase in monthly expenditure stems from significant increases in the expenditure of food, protein, social events, and health expenditure. The increase in health expenditure entails that an increase in happiness causes an increase in the share of the total household budget devoted to health care, for the treatment group. Expenditure on health care increases significantly for the different treatment arms. A significant amount of the monthly expenditure in female recipient households stems from health expenditure. In a female recipient household, a one index point increase in the happiness score leads to a 17.7% increase in the share of the budget devoted to health care. The impact

of an increase in happiness scores on health care expenditure is of a greater magnitude for households who receive large transfers than small transfers, and for households that receive monthly transfers instead of lump-sum transfers. These findings support the estimates in table 3 that improved psychological well-being will improve health expenditure significantly.

Further support is provided by estimates in table 6, where an improvement in life satisfaction of the recipient significantly increases their monthly expenditure. The increase in monthly expenditure stems from increases in food, protein, social events and health expenditure. For the treatment group an increase in life satisfaction leads to an 18.82% increase in the share of the budget devoted to health care. When analysing the different treatment arms it is clear that only female recipient households devote a statistically significant share of their budget to health care. When considering size of the transfer, neither monthly nor large transfer recipients spend significantly on health care, their monthly expenditure is devoted to food, protein, cereals and social expenditure. Moreover, besides reduced depression, increased happiness and life satisfaction, the reduction in stress also impacts the psychological well-being index positively.

In table 2, the evidence is provided that the reduction in stress partly explains the positive impact of the cash transfer on the psychological well-being index. Significant changes in monthly expenditure stem from increases in stress levels. Table 10 depicts the estimates of the effect a reduction in stress has on household consumption. Since stress is negatively coded, the negative signs in table 9 indicate positive effects. Hence, a reduction in stress causes a significant increase in the monthly expenditure of a recipient household. The increase in monthly expenditure stems from food, protein, social events, and health expenditure. For the treatment group, it is estimated that a reduction in stress levels leads to a more significant share (10.82%) of the budget devoted to health care. Again, my estimates indicate that female recipient households spend more on health care. Furthermore, the impact of a reduction in stress levels causes an increase in medical expenditure that is of a greater magnitude for households that receive a massive transfer than the recipients of the monthly transfers.

Although tables 4, 5, 6, and 10 depict significant impacts on household consumption. There are other psychological well-being variables like trust, optimism, self-esteem, and cortisol levels, which had no impact on the monthly household expenditure of the cash transfer recipient. Therefore, from all the results depicted in the appendix, it is clear that the primary psychological impacts on health care stem from a reduction in depression, an increase in life satisfaction, an increase in happiness, and a reduction in stress level. These results indicate that

psychological well-being has a direct impact on the health choices of the poor. For instance, an increase in depression scores will significantly derail the impact of the cash transfer on monthly expenditure, and health choices. The significance of the first stage OLS estimates follows through in the two-stage IV estimation. The results indicate that an improvement in psychological well-being leads to people spending more. Additionally, the estimates also depict that increases in health care expenditure are more likely in female recipient households. This result further supports the hypothesis set out earlier, as it provides insight which recipients spends more on medical expenditure, when their psychological well-being improves.

However, there is evidence from the field of psychology that poverty plays a role in producing these psychological states, and the results do not allow for stating that poor people are actively spending money to improve their psychological well-being (Amato & Zuo, 1992). It does allow for the statement that these improved psychological states stem from having money, which was confirmed by H-S. Moreover, the reasons as to why expenditure on health care increases significantly cannot be explicitly stated, but it is highly unlikely that it would be to treat psychological ailments. The reason is that the participants of this study, in western Kenya, are extremely poor, and receiving treatment for psychological ailments would not be higher on their to-do list. It is more likely that the significant increases in health expenditure stem from increases in physical ailments. Therefore, from the results stated in the appendix, and the analysis above, it is clear that an improvement in the psychological well-being of the recipient will increase their household expenditure. The results also indicate that the increase in household expenditure positively impacts the consumer behaviour of households, as households tend to spend more on food, social events, and medical expenditure. Hence, the results determined support the hypothesis this study was aimed at determining. Which is that through improved psychological well-being recipient health choices improve; and that this improvement in psychological well-being changes consumer behaviour of recipient households.

5. Conclusion

This paper explores the casual effects of multidimensional psychological well-being on poverty. Despite there being several studies on the association between psychological well-being and poverty, not much, if anything, is available on the causal direction between psychological well-being and poverty. The goal of this paper was to contribute to the literature by shedding light on which way the causal relationship flows. Therefore, using data provided by H-S, from their UCT study conducted in Kenya, I hoped to extend on their work while encouraging further research on the topic.

This paper illustrated just how village recipient households of the cash transfers altered their expenditure behaviour by spending a significant share of their income on food, protein, social events, and health care. In this paper, I illustrated that an improvement in the psychological well-being index improves recipient household consumption, using OLS estimation. Although this estimation provided significant findings, it did not do enough to showcase precisely what aspect of the psychological well-being index impacts consumption and how. Hence, using the IV estimation, I find that reductions in depression and stress levels, along with increases in happiness and life satisfaction, all significantly impact household consumption. Additionally, these all have a significant effect on the health expenditure of the recipient households, especially in households where women received exogenous cash transfers. Estimates were indicating that female-headed households devoted a significantly large share of their budget to health care. It has been found that income is a predictor for high household expenditure on households, but my findings showcase that this is more likely in female-headed households. This finding indicates that when income is increased, the psychological well-being of the recipient increases and a significant proportion of their budget will be spent on health care.

Moreover, the estimations depicted significant results and agreed with the hypothesis that when there is an increase in income, the improved psychological well-being will improve consumer expenditure, especially on health care. These significant findings indicate that when study participants received their cash transfers, they spent it on what they needed most, and health care was included in that list. This is significant because these study participants are extremely poor, and it was not expected for health care to be on their to-do list once they receive income. However, what can be expected is that the increase in health care expenditure was not for mental health issues, but more for physical ailments. Therefore, understanding the effects of positive and negative economic shocks on psychological well-being, and how the poor perceive

health can be a rewarding future endeavour, because the poor and mental health should not be two ends of a spectrum.

References

- Aizer, A., Eli, S., Ferrie, J. & Liera-Muney, A. 2016. Long-run impact of cash transfers to poor families. *American Economic Review*.table 106(4):935-971.
- Alloush, M. 2017. *Income, Psychological Well-being, and the Dynamics of Poverty: Evidence from South Africa*. Job Market Paper.
- Amato, P. R. & Zuo, J. 1992. Rural poverty, urban poverty, and psychological well-being. *The Sociological Quartely*. 33(2):229-240.
- Anand, P. & Lea, S. 2011. The psychology and behavioural economics of poverty. *Journal of Economic Psychology*. Volume 32:284-293.
- Arnold, J. 1991. *Work psychology: Understanding human behaviour in the work place*. London:
- Bagozzi, R. 2000. The poverty of economic explanations of consumption and an action theory alternative. *Managerial and Decision Economics*. Volume 21:95-109.
- Baum, C. F. 2007b. *Instrumental variables: Overview and advances*. London: Boston College and DIW.
- Baum, C. F. 2007. *Instrumental Variables Estimation in Stata*. Boston: Boston College.
- Bray, J. 2008. *Consumer behaviour theory: Approaches and models*. Bournemouth: Bournemouth University.
- Briggs, R. 2018. *Normative theories of rational choice:Expected Utility*, Santa Clara: The Stanford Encyclopedia of Philosophy.
- Browning, M. & Chiappori, A. 1998. Efficient intra-household allocations: A general characterization and empirical tests. *Econometrica*. 66(6):1241-1278.
- Buse, A. 2003. Instrumental variables. *The Journal of Economic Perspectives*. 17(1): 224-226.
- Cacioppo, J., Petty, R., Losch, M. & Kim, H. S. 1986. Electromyographic activity over facial muscle regions can differentiate the valence and intensity of affective reactions. *Journal of Personality and Social Psychology*. Volume 50:260-268.
- Carlisle, S. & Hanlon, P., 2007. Well-being and consumer culture: A different kind of public health problem?. *Health Promotion International*, 22(3), pp. 26-268.

- Chiappori, P.-a. & Donni, O. 2009. *Non-unitary Models behaviour: A survey of the literature*. Bolon: IZA.
- Cohen, S., Kamarck, T. & Mermelstein, R. 1983. A global measure of perceived stress. *Journal of Health and Social Behaviour*. Volume 24:386-396.
- Crown, W., Henk, H. & Vanness, D. J. 2011. Some Cautions on the Use of Instrumental Variables Estimators in outcome research: How bias in instrumental variable estimators is affected by instrument strength, instrument contamination, and sample size. *Value in Health*. Volume 14:1078-1084.
- Das, J. et al. 2007. Mental Health and poverty in developing countries: Revisiting the relationship. *Social Science & Medicine*. Volume 65, pp. 467-480.
- De Hoop, J., Baid, S. & özel, B. 2013. Income shocks and adolescent mental health. *Journal of Human Resources*. 48(2):371-402.
- Deaton, A. 1996. *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Baltimore: Johns Hopkins University Press.
- Deaton, A. & Muellbauer, J. 1980. *Economics and Consumer Behaviour*. Cambridge: Cambridge University Press.
- Diener, E., Suh, E. M., Lucas, R. E. & Smith, H. L. 1999. Subjective well-being: Three decades of progress. *Psychological bulletin*. Issue 125: 276-302.
- Diener, P., Suh, E., Lucas, R. & Smith, H. 1999. Subjective wellbeing: Three decades of progress. *Psychological Bulletin*. 125(2):276-302.
- Easterlin, R. A. 2001. Income and happiness: Towards a unified theory. *The economic Journal*. Volume 111:465-484.
- Ferrer-i-Carbonell, A. 2004. Income and well-being: An empirical analysis of the comparison income effect. *Journal of Public Economics*. Volume 89: 997-1019.
- Fiszbein, J. & Schudy, N. 2009. *Conditional Cash Transfers*. Washington, D.C: The World Bank.
- Frey, B. S. & Stutzer, A. 2002. What can economists learn from happiness research?. *Journal of Economic Literature*. 40(2):402-435.

- Hanandita, W. & Tampubolon, G. 2014. Does poverty reduce mental health? An instrumental variable analysis. *Social Science & Medicine*. Volume 113:59-67.
- Haushofer, J. 2013. *The psychology of poverty: Evidence from 43 Countries*. MIT.
- Haushofer, J. & Shapiro, J. 2016. The short-term impact of unconditional cash transfers to the poor: Experimental evidence from Kenya. *Quarterly Journal of Economics*, 131(1):1973-2042.
- Kahneman, D., Diener, E. & Schwarz, N. 2003. *Well-being: The foundations of hedonic psychology*. Russell Sage Foundation.
- Knorr, U., Vinberg, M., Kessing, L. V. & Weeterstev, J. 2010. Salivary cortisol in depressed patients vs control persons: systemic review and meta-analysis. *Psychoneuroendocrinology*. 35(9):1275-1286.
- Lewbel, A. 2006. *Engel Curves*, Boston: Boston College.
- Liebman, J., Kling, J. R. & Katz, L. 2006. Experimental analysis of neighborhood effects. *Econometrica*.
- Loignon, C. et al. 2015. Perceived barriers to healthcare for persons living in poverty in Quebec, Canada: The EQUIhealThy project. *International Journal Of Equality in Health*. 14(4):1-11.
- Lund, C. et al. 2010. Poverty and common mental disorders in low and middle income countries: A systematic review. *Social Science Medicine*. 71(3):417-528.
- Mani, A., Mullainathan, S., Shafir, E. & Zhao, J. 2013. Poverty impedes cognitive function. *Science*. 341(6149): 976-982.
- Meyer, B. & Sullivan, J. 2003. *Measuring the well-being of the poor using income and consumption*. Cambridge : National Bureau of Economic Research .
- Molla, A., Chi, C. & Mondaca, L. 2017. Predictors of high out-of-pocket healthcare expenditure: an analysis using Bangladesh household income and expenditure survey. *BMC Health Services research*. 17(98):1-8.
- Mongin, P. 1997. Expected utility theory. In: E. Elgar, ed. *Handbook of Economic Methodology*. London:342-350.
- Mostert, P. G. 2002. *Buying behaviour of South African internet users*, Pretoria: University of Pretoria.

- O'hare, S. 2014. *Essays On Poverty & Wellbeing* . Stirling Management School.
- Parekh, A., Macinnes, T. & Kenwag, P. 2010. *Monitoring poverty and Social exclusion*. Joseph Rowntree Foundation .
- Preston, S. H. 1975. The changing relation between mortality and level of economic development. *Population Studies*, 29(2):231-248.
- Radloff, L. S. 1977. The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3):385-401.
- Rajan, K., Kennedy, J. & King, L. 2013. Is wealthier always healthier? The health implications of income inequality, poverty, and literacy in India. *Social Science & Medicine*, Volume 88: 98-107.
- Rojas, M. 2004. *Well-being and the complexity of poverty : A subjective well-being approach*, Helsinki: WIDER.
- Stewart, J. 1994. The Psychology of decision making. D. Jennings & S. Wattam, eds. *Decision Making: An Intergrated approach*. London: Pitman.
- The Royal Swedish Academy of Sciences. 2015. *Angus Deaton: Consumption, Poverty and Welfare*, Sweden: The Royal Swedish Academy of Sciences.
- Thomas, D.,1990. Intra-household resource allocation: An inferentia approach. *Journal of Human Resources*, 25(4): 635-664.
- Van Renseburg, J. J. 2013. The psychology of poverty. *Verbum et Ecclesia*, 34(1):1-10.
- Watson, J. 1920. Conditional emotional reactions. *Journal of Experimental Psychology*, 3(1): 1-14.
- Weitzman, E. R. 2004. Poor mental health, depression and association with alcohol consumption; harm, and abuse in a national sample of young adults in college. *Journal of Nervous and Mental Disease*, Volume 192:269-277.
- World Health Organisation. 2017. *Depression and Other Common Mental Disorders: Global Health Estimates*, Geneva : World Health Organisation.
- Wood, A., Taylor, P. & Josph, S. 2010. Does CES-D measure a contiuum from depression to happiness? Comparing substantive and artifactual models. *Psychiatry Research*, Volume 177: 120-123.

Zinkhan, G. M. 1992. Human nature and models of consumer decision making. *Journal of Advertising* , 21(4): 1-3.

Tables

Table 1: Consumer Budget Share Treatment effects

VARIABLES	(1) Control Mean	(2) Treatment	(3) Female Recipient	(4) Monthly Transfer	(5) Large Transfer	(6) N
Food Share	64.08 (13.81)	-5.365*** (0.893)	1.726 (1.425)	4.049*** (1.455)	-7.530*** (1.378)	940
Cereal share	14.01 (9.32)	-2.056*** (0.525)	0.927 (0.716)	0.581 (0.853)	-1.950*** (0.675)	940
Meat & fish Share	7.86 (6.55)	1.013** (0.405)	0.664 (0.621)	-0.368 (0.675)	0.696 (0.619)	940
Alcohol Share	3.97 (12.14)	-1.111 (0.712)	0.871 (1.038)	1.602 (1.049)	-1.291 (0.874)	940
Tobacco Share	1.00 (3.09)	-0.284* (0.166)	0.0603 (0.234)	0.380 (0.251)	-0.457** (0.189)	940
Social expenditure Share	2.72 (3.30)	0.506** (0.249)	-0.762 (0.467)	-0.115 (0.501)	-0.311 (0.396)	940
Education expenditure share	2.79 (4.10)	-0.347 (0.243)	0.511 (0.345)	-0.119 (0.377)	-0.190 (0.365)	940
Medical expenditure share	4.19 (7.71)	0.0125 (0.476)	0.949 (0.748)	-0.466 (0.782)	-0.967 (0.649)	940
Non-durable Expenditure	96.37 (7.81)	-5.304*** (0.670)	1.857* (1.096)	2.352** (1.170)	-6.504*** (1.340)	940
Joint test (P-value)		0.00***	0.28	0.25	0.00***	

Notes: These are the OLS estimates and spillover effects. All variables are in budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 2: First Stage estimation of psychological well-being

VARIABLES	Control Mean	Treatment	Female Recipient	Monthly Transfer	Large Transfer	N
Log cortisol (No controls)	2.46 (0.89)	0.00 (0.05)	-0.17** (0.07)	0.16* (0.08)	-0.09 (0.07)	1456
Log cortisol (with controls)	-0.01 (0.88)	0.00 (0.05)	-0.17** (0.07)	0.17** (0.08)	-0.12* (0.07)	1456
Depression (CESD)	26.14 (9.27)	-1.16*** (0.44)	-0.77 (0.67)	-1.40* (0.73)	-1.22* (0.68)	1474
Worries	-0.08 (0.00)	-0.13*** (0.05)	-0.04 (0.07)	-0.11 (0.08)	-0.07 (0.08)	1474
Stress (Cohen)	-0.11 (1.01)	-0.26*** (0.05)	-0.02 (0.08)	-0.02 (0.09)	-0.24*** (0.08)	1474
Happiness (WVS)	0.00 (1.00)	0.16*** (0.05)	0.07 (0.08)	0.03 (0.09)	0.07 (0.08)	1474
Life satisfaction (WVS)	0.05 (1.00)	0.17*** (0.05)	-0.07 (0.07)	0.12 (0.08)	0.19** (0.08)	1474
Trust (WVS)	0.03 (1.00)	0.04 (0.05)	0.08 (0.08)	-0.08 (0.08)	-0.04 (0.08)	1474
Optimism (Scheier)	0.00 (1.00)	0.10* (0.05)	0.07 (0.08)	0.02 (0.09)	0.16* (0.09)	1474
Self-esteem (Rosenberg)	0.00 (1.00)	0.00 (0.05)	0.19** (0.09)	0.09 (0.09)	-0.15 (0.10)	1474
Psychological well-being index	0.07 (1.00)	0.26*** (0.05)	0.14* (0.08)	0.015 (0.08)	0.26*** (0.08)	1474
Joint P-Value		0.00***	0.21	0.21	0.00***	

Notes: This table is a replication of the table found in Haushofer and Shapiro (2016), on page 52, as it used to depict first stage OLS estimates of psychological well-being. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. All variables are coded in z-score units, except raw cortisol, which is coded nmol/l, and depression, which is coded in points. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 3: Psychological Well-being index on expenditure

VARIABLES (USD)	Psychological Well-being IV					N
	Control mean	Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food Total Expenditure	104.46 (58.497)	90.25*** (32.65)	88.85*** (27.17)	63.06*** (20.50)	63.02*** (20.50)	923
Cereals Expenditure	22.55 (17.18)	9.901 (6.581)	9.241* (5.462)	9.984** (4.950)	9.955** (4.948)	923
Meat & fish Expenditure	12.96 (13.75)	25.08*** (8.603)	20.98*** (6.471)	16.60*** (5.140)	16.48*** (5.124)	923
Alcohol Expenditure	6.38 (16.56)	-5.504 (5.452)	0.974 (4.358)	-4.813 (4.050)	-4.772 (4.048)	923
Tobacco Expenditure	1.52 (4.13)	-1.104 (1.306)	-0.376 (1.071)	-1.170 (0.985)	-1.167 (0.985)	923
Social Expenditure	4.36 (5.38)	12.11*** (4.270)	9.819*** (3.150)	7.685*** (2.488)	7.665*** (2.486)	923
Education Expenditure	4.71 (8.68)	2.538 (3.003)	3.184 (2.571)	2.306 (2.242)	2.303 (2.242)	923
Medical Expenditure	6.78 (13.53)	12.81** (6.494)	13.81** (5.610)	6.593 (4.178)	6.568 (4.176)	923
Non-Durable Expenditure	157.61 (82.18)	165.3*** (55.52)	164.3*** (46.44)	126.6*** (35.06)	126.3*** (35.02)	923

Notes: These are the 2SLS estimates of the psychological well-being index on expenditure. All variables are in US\$ and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 4: Cortisol Levels on Expenditure

Variables	Log Cortisol IV				N
	Treatment	Female Recipient	Monthly Transfer	Large Transfers	
Food total	435.1 (538.1)	19.24 (31.13)	7.223 (28.17)	25.35 (42.78)	919
Cereals	46.74 (62.57)	-0.0603 (8.292)	-5.662 (7.935)	-7.419 (11.92)	919
Meat & fish	122.0 (151.5)	4.975 (7.706)	-4.311 (6.978)	10.65 (11.42)	919
Alcohol	-26.41 (40.51)	-13.36 (8.618)	3.700 (6.785)	1.597 (9.829)	919
Tobacco	-5.301 (8.881)	-1.209 (1.827)	0.706 (1.652)	1.051 (2.456)	919
Social expenditure	58.10 (71.74)	10.25** (5.011)	1.417 (3.228)	6.512 (5.623)	919
Education expenditure	12.01 (19.98)	-2.484 (4.140)	-0.864 (3.726)	-1.085 (5.485)	919
Medical expenditure	58.70 (76.36)	-5.313 (7.258)	4.491 (6.725)	14.22 (11.94)	919
Non-durable expenditure	791.2 (972.2)	29.99 (44.78)	-16.92 (40.86)	11.46 (59.34)	919

Notes: These are the 2SLS estimates of log cortisol on disaggregated consumption instrumented by treatment status. All variables are in budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 5: Depression on expenditure instrumented by treatment status

Variables	Control Mean	Depression IV				N
		Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	-18.32* (10.34)	-15.09** (5.920)	-7.636** (3.312)	-10.31** (4.437)	923
Cereals	22.55 (17.18)	-2.010 (1.577)	-1.411 (0.935)	-1.201 (0.769)	-1.747* (0.977)	923
Meat & fish	12.96 (13.75)	-5.091* (2.878)	-3.063** (1.294)	-1.489* (0.762)	-2.656** (1.152)	923
Alcohol	6.38 (16.56)	1.117 (1.198)	-0.533 (0.733)	0.442 (0.615)	0.817 (0.741)	923
Tobacco	1.52 (4.13)	0.224 (0.278)	0.00797 (0.173)	0.143 (0.152)	0.206 (0.180)	923
Social expenditure	4.36 (5.38)	-2.459* (1.370)	-1.682** (0.671)	-0.842** (0.377)	-1.223** (0.525)	923
Education expenditure	4.71 (8.68)	-0.515 (0.651)	-0.512 (0.436)	-0.287 (0.348)	-0.397 (0.410)	923
Medical expenditure	6.78 (13.53)	-2.599 (1.823)	-2.144** (1.093)	-0.634 (0.648)	-0.982 (0.798)	923
Non-durable expenditure	157.61 (82.18)	-33.55* (18.53)	-27.85*** (10.55)	-14.85*** (5.658)	-21.08** (8.231)	923

Notes: These are the 2SLS estimates. All variables are in shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 6: Happiness on expenditure instrumented by treatment status

Variables	Happiness IV					N
	Control Mean	Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	119.7** (52.46)	120.4** (52.59)	109.2** (44.89)	114.0** (47.02)	923
Cereals	22.55 (17.18)	13.13 (9.325)	13.37 (9.352)	14.29 (8.713)	15.34* (9.072)	923
Meat & fish	12.96 (13.75)	33.26** (14.06)	33.48** (14.10)	27.58** (11.19)	30.73** (12.29)	923
Alcohol	6.38 (16.56)	-7.297 (7.525)	-6.516 (7.394)	-6.839 (6.794)	-7.819 (7.050)	923
Tobacco	1.52 (4.13)	-1.464 (1.801)	-1.407 (1.789)	-1.649 (1.664)	-1.764 (1.708)	923
Social expenditure	4.36 (5.38)	16.06** (6.936)	15.67** (6.792)	13.72** (5.631)	14.57** (5.979)	923
Education expenditure	4.71 (8.68)	3.365 (4.003)	3.591 (4.019)	3.511 (3.661)	3.701 (3.745)	923
Medical expenditure past month	6.78 (13.53)	16.98* (9.647)	17.70* (9.820)	13.04* (7.892)	13.97* (8.232)	923
Non-durable expenditure	157.61 (82.18)	219.2** (91.12)	221.1** (91.55)	206.7*** (79.26)	219.0*** (84.39)	923

Notes: These are the 2SLS estimates. All variables are in budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 7: Life satisfaction on expenditure instrumented by treatment status

Variables	life Satisfaction IV					N
	Control Mean	Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	132.7** (59.38)	94.58*** (26.98)	98.54** (38.27)	103.5** (40.24)	923
Cereals	22.55 (17.18)	14.55 (10.28)	7.565 (5.213)	14.51* (8.126)	15.65* (8.485)	923
Meat & fish	12.96 (13.75)	36.87** (16.31)	16.77*** (5.719)	24.08** (9.535)	27.29*** (10.54)	923
Alcohol	6.38 (16.56)	-8.091 (8.161)	2.354 (4.415)	-6.597 (6.302)	-7.622 (6.531)	923
Tobacco	1.52 (4.13)	-1.624 (1.958)	-0.00363 (1.069)	-1.699 (1.556)	-1.826 (1.600)	923
Social expenditure	4.36 (5.38)	17.81** (7.890)	12.26*** (3.431)	11.91** (4.659)	12.77** (4.972)	923
Education expenditure	4.71 (8.68)	3.731 (4.475)	2.389 (2.478)	3.453 (3.514)	3.659 (3.603)	923
Medical expenditure	6.78 (13.53)	18.82* (10.42)	10.42** (4.822)	10.42 (6.674)	11.32 (6.943)	923
Non-durable expenditure	157.61 (82.18)	243.0** (102.4)	172.6*** (44.64)	192.0*** (66.87)	204.9*** (71.73)	923

Notes: These are the 2SLS estimates. All variables are in budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 8: Optimism on expenditure instrumented by treatment status

Variables	Control Mean	Optimism IV				N
		Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	219.9 (163.0)	164.3 (113.7)	125.1* (67.20)	128.0* (68.93)	923
Cereals	22.55 (17.18)	24.12 (21.69)	21.11 (18.16)	20.65 (13.21)	21.47 (13.59)	923
Meat & fish	12.96 (13.75)	61.11 (44.84)	50.88 (34.16)	30.58* (16.40)	33.04* (17.55)	923
Alcohol	6.38 (16.56)	-13.41 (15.78)	-6.039 (12.00)	-9.258 (9.423)	-10.07 (9.683)	923
Tobacco	1.52 (4.13)	-2.691 (3.609)	-1.959 (3.039)	-2.442 (2.337)	-2.534 (2.377)	923
Social expenditure	4.36 (5.38)	29.51 (21.64)	17.21 (12.08)	14.67* (7.831)	15.24* (8.131)	923
Education expenditure	4.71 (8.68)	6.184 (8.175)	6.842 (7.599)	4.758 (5.113)	4.896 (5.181)	923
Medical expenditure	6.78 (13.53)	31.20 (25.30)	31.18 (22.81)	11.75 (9.849)	12.36 (10.09)	923
Non-durable expenditure	157.61 (82.18)	402.8 (293.7)	306.0 (205.1)	252.3** (127.1)	261.0** (132.0)	923

Notes: These are the 2SLS estimates. All variables are budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 9: Self-esteem on expenditure instrumented by treatment status

Variables	Control Mean	Self-Esteem IV				N
		Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	1,119 (4,068)	-44.92 (31.28)	-9.906 (50.02)	-5.947 (65.23)	923
Cereals	22.55 (17.18)	122.7 (449.3)	0.440 (7.434)	-14.27 (16.65)	-18.40 (24.05)	923
Meat & fish	12.96 (13.75)	310.9 (1,127)	0.479 (6.683)	-11.54 (14.41)	4.385 (16.40)	923
Alcohol	6.38 (16.56)	-68.22 (251.3)	0.0658 (6.477)	8.137 (13.29)	5.779 (16.54)	923
Tobacco	1.52 (4.13)	-13.69 (51.42)	-0.341 (1.589)	1.767 (3.168)	2.384 (4.391)	923
Social expenditure	4.36 (5.38)	150.2 (544.8)	-10.48** (4.886)	-0.173 (5.672)	3.836 (8.192)	923
Education expenditure	4.71 (8.68)	31.46 (119.0)	1.167 (3.626)	-2.345 (6.775)	-3.264 (9.090)	923
Medical expenditure	6.78 (13.53)	158.7 (577.8)	3.906 (6.540)	4.564 (12.03)	13.01 (18.98)	923
Non-durable expenditure	157.61 (82.18)	2,049 (7,443)	-76.70 (47.09)	-76.46 (85.82)	-74.26 (111.2)	923

Notes: These are the 2SLS estimates. All variables are budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 10: Stress on expenditure instrumented by treatment status

Variables	Control Mean	Stress IV				N
		Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	-76.27*** (24.63)	-80.86*** (20.87)	-66.39*** (20.04)	-66.40*** (20.06)	923
Cereals	22.55 (17.18)	-8.368 (5.389)	-7.496* (4.369)	-9.581** (4.772)	-9.517** (4.772)	923
Meat & fish	12.96 (13.75)	-21.20*** (6.399)	-17.28*** (4.731)	-18.01*** (5.091)	-17.70*** (5.055)	923
Alcohol	6.38 (16.56)	4.652 (4.576)	-0.374 (3.598)	4.839 (3.980)	4.731 (3.978)	923
Tobacco	1.52 (4.13)	0.933 (1.093)	0.289 (0.884)	1.110 (0.956)	1.103 (0.957)	923
Social expenditure	4.36 (5.38)	-10.24*** (3.197)	-10.09*** (2.606)	-8.370*** (2.489)	-8.330*** (2.487)	923
Education expenditure	4.71 (8.68)	-2.145 (2.502)	-2.340 (2.065)	-2.262 (2.176)	-2.257 (2.178)	923
Medical expenditure	6.78 (13.53)	-10.82** (5.119)	-10.48** (4.170)	-7.735* (4.126)	-7.679* (4.127)	923
Non-durable expenditure	157.61 (82.18)	-139.7*** (40.90)	-148.3*** (34.94)	-130.1*** (33.95)	-129.6*** (33.91)	923

Notes: These are the 2SLS estimates. All variables are budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 11: Trust on expenditure instrumented by treatment status

Variables	Trust IV					N
	Control Mean	Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	539.5 (916.4)	-65.76 (77.17)	100.8 (119.8)	100.9 (119.9)	923
Cereals	22.55 (17.18)	59.18 (106.5)	3.058 (16.28)	-5.996 (20.54)	-5.919 (20.52)	923
Meat & fish	12.96 (13.75)	149.9 (253.5)	15.07 (18.25)	33.52 (35.94)	33.83 (36.20)	923
Alcohol	6.38 (16.56)	-32.90 (64.18)	-22.11 (22.14)	-0.865 (17.37)	-0.969 (17.38)	923
Tobacco	1.52 (4.13)	-6.602 (13.33)	-3.047 (4.098)	0.986 (4.368)	0.978 (4.367)	923
Social expenditure	4.36 (5.38)	72.41 (123.3)	-8.712 (9.183)	17.93 (19.16)	17.99 (19.20)	923
Education expenditure	4.71 (8.68)	15.17 (31.38)	-0.327 (7.779)	-0.136 (9.641)	-0.126 (9.641)	923
Medical expenditure past month	6.78 (13.53)	76.54 (133.1)	2.901 (14.03)	27.52 (31.42)	27.59 (31.48)	923
Non-durable expenditure	157.61 (82.18)	988.2 (1,675)	-116.9 (121.6)	123.5 (157.7)	124.2 (158.3)	923

Notes: These are the 2SLS estimates. All variables are budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.

Table 12: Worries on expenditure instrumented by treatment status

Variables	Control Mean	Worries IV				N
		Treatment	Female Recipient	Monthly Transfer	Large Transfer	
Food total	104.46 (58.497)	-155.6* (83.62)	7.867 (22.22)	-119.3** (59.57)	-158.3* (84.01)	923
Cereals	22.55 (17.18)	-17.06 (13.08)	-2.256 (6.028)	-12.83 (10.38)	-18.82 (13.50)	923
Meat & fish	12.96 (13.75)	-43.23* (22.58)	-8.918 (5.881)	-26.77** (13.63)	-43.51* (22.48)	923
Alcohol	6.38 (16.56)	9.487 (9.983)	9.865* (5.889)	5.490 (8.083)	10.10 (10.02)	923
Tobacco	1.52 (4.13)	1.904 (2.350)	1.320 (1.324)	1.462 (1.986)	2.127 (2.368)	923
Social expenditure	4.36 (5.38)	-20.88* (11.02)	0.0275 (2.511)	-14.96** (7.365)	-20.87* (10.91)	923
Education expenditure	4.71 (8.68)	-4.374 (5.583)	0.119 (2.908)	-3.425 (4.690)	-4.706 (5.604)	923
Medical expenditure past month	6.78 (13.53)	-22.07 (14.38)	-1.741 (5.218)	-15.01 (10.33)	-21.33 (13.96)	923
Non-durable expenditure	157.61 (82.18)	-284.9* (149.4)	14.17 (31.81)	-212.1** (102.1)	-295.2* (152.6)	923

Notes: These are the 2SLS estimates. All variables are budget shares and are top-coded for the highest 1% observations. Column (1) reports the mean and standard deviation of the control group for a given outcome variable. Column (2) reports the basic treatment effect, i.e. comparing treatment households to control households within villages. Column (3) reports the relative treatment effect of transferring to the female compared to the male; column (4) the relative effect of monthly compared to lump-sum transfers; and column (5) that of large compared to small transfers. All columns control for baseline outcomes and include village fixed effects. The last row shows joint significance of the coefficients in the corresponding column from SUR estimation. * denotes significance at 10%, ** at 5%, and *** at 1% level.